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# China Report

SCIENCE AND TECHNOLOGY

No. 200

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22 June 1983

# CHINA REPORT

## SCIENCE AND TECHNOLOGY

No. 200

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## NATIONAL DEVELOPMENTS

### REFORM OF SCIENCE AND TECHNOLOGY PERSONNEL ADMINISTRATIVE SYSTEM SURVEYED

Nanjing JIANGHAI XUEKAN [JIANGHAI ACADEMIC JOURNAL] in Chinese No 2, 1983 pp 58-60

[Article] by Zhu Junkan (2612 6874 0170): "A Survey of Reform of the Science and Technology Personnel Administrative System in Changzhou City"

[Text] Changzhou City was one of the cities in Jiangsu Province in which a comparatively early investigation was made of reform of the personnel system. After the Third Plenary Session of the Eleventh Central Committee, they made a positive and reliable attempt at reforming science and technology personnel administrative system and obtained preliminary results. In the following text, we shall discuss our preliminary survey of this reform in Changzhou City.

Personnel work is a strenuous task and the work is concrete. How can one do a good job of this kind of work? In an industrial city in particular, how can one start out from reality, and around a core of economic construction, make personnel work serve the development of economic construction even more effectively?

In view of the situation in Chengzhou City, the personnel system that has been developed since the establishment of the nation is generally suited to national conditions and has been effectively implemented. However, when socialist construction entered its new stage, there were changes in circumstances and some old established practices, old conventions and old methods have become unsuitable. For this reason, an urgent need has arisen for reform in personnel work. On the basis of the situation in Chengzhou City, in order to further develop the economy during the period of the readjustment of the national economy, we must continue to expand light industry, increase the production of consumer goods, continually develop new products, actively foster collective enterprises, do a good job of reorganizing and combining enterprises and increase the competitive capacity of products on the domestic and international markets. These formidable tasks have made new demands on personnel work. The most important problem is how development, selection, use and management of qualified personnel can be adapted to these changed circumstances and new tasks.

There is a profound feeling that there are two major contradictions in the practice of personnel work in the personnel department of Chengzhou City. One

of these is that the corps of specialized technical cadres is far from suited to the requirements of economic development. 1. It is not adequate in number. There is a total of 6543 engineers and technicians at present in the city as a whole, a number amounting to only 3.8 percent of the total number of industrial staff and workers. 2. There are too few who are of a high level, there being only 29 senior engineers and technicians, a number amounting to only 0.4 percent of the total number of engineers and technicians. 3. Their distribution is not sufficiently rational. In terms of the proportions between specialists and technicians on the one hand and the total number of workers, there are 2.4 times as many in the machine and electronics industries than in the light textile industry and seven times as many as in all of the collective enterprises in the nation. There are still some small plants that do not have technical personnel. Second, over the past several years economic work has been carried out more and more actively and economic policy has been continually lax. However, the method of management for general administrative cadres, who are controlled too strictly and who are integrated too rigidly, has basically continued in use for specialized and technical cadres. "Staying at a post for life" and "being the possession of one's department or unit" have become widespread "principles" of the scientific and technical cadre administrative system. This has reached the point at which, on one hand, there is a shortage of qualified personnel and there are some technical problems that cannot be solved because of lack of persons, while, on the other hand, qualified personnel are at leisure and in over supply being forced into idleness and waste, with the serious phenomenon occurring of there being no use for their knowledge and that they are used for things at which they are not expert. Of these two major contradictions, the major contradiction is the latter. That is, the scientific and technical cadre administrative system is falling behind economic conditions, which are developing day by day. They obtained an even deeper knowledge from the following example. When scientific and technical cadres were being selected in 1980, the municipal government requested other industries to select scientific and technical personnel to support light industry in order to back the expansion of light industry and the Personnel Bureau assigned 55 persons for selection for this mission. However, after 6 months of effort, only 24 persons had been transferred. When it comes to transferring a scientist or technician, his current unit is often not willing to let him go. Thus, there is either opposition to letting him go on the part of his unit or the person himself is not willing to go. It is not until the "three agreements" have been made that a transfer can be achieved. They deeply felt that the initiative and creativity of the broad groups of scientific and technical personnel cannot be aroused and the capabilities of scientific and technical personnel cannot be fully utilized unless the "bounds of departments and units" can be shattered. They believe that this small production system of cadre administration, which has lagged behind large-scale production, is far from capable of meeting the demands of modernized production. For this reason, they decided first to conduct an active and reliable reform of the science and technology cadre administrative system.

In the course of making the reforms, they proceeded systematically and gradually, putting the following systems into practice.

First, they implemented a job advertisement system in order to promote a rational flow of qualified personnel.

Under the existing system of unified assignment of university and middle school specialized students, the system and method is basically one of a single assignment without reassignments being made. Once various types of specialists and technicians have been assigned, they are generally employed and supervised for long periods by their work units and to a certain extent their employment is for life. After work assignments have been made, specialists and technical personnel generally find it difficult to leave their units even if the specialized and technical requirements of the units to which they belong have changed or if there have been any changes in the skills of the specialist. This system of a person "being the possession of his unit" seriously impedes the rational flow and rational use of qualified personnel and is not advantageous to building the four modernizations in our nation. By implementing advertising for qualified personnel, we can to a certain extent break the confines of "possession by one's unit" and promote the rational flow of qualified personnel. This can serve as a supplement to unified state assignment.

From the end of 1980 to October 1981, Changzhou City advertised twice for the specialists and technicians required by the textile industry, with 590 persons registering in response to the call. Examinations were given and 59 persons qualified and were employed to fill the vacancies. To a definite extent, this replenished and strengthened the technical forces of the textile industry.

Might not implementing job advertisement throw the cadre corps into disorder? Might it not result in mobility? Practice in Chengzhou City tells us that if job advertising is implemented in an organized way, with leadership, with limits and with a direction, it will be unified without being rigid and active without being disordered. Thus it will both be possible to break through the bounds of departments and units and also to avoid the occurrence of irrational flow of qualified personnel. In the course of job advertising, they stuck to the following four principles.

1. There is organization and leadership. Job advertising work in the city is carried out under unified organization by the leaders of the municipal government and by the personnel department. In this way, they have succeeded in preventing "private recruitment and disorderly searches" for personnel among individual units, with effective results having been obtained.

2. Flow in a positive direction. When job advertising was implemented, Changzhou City stipulated three principles of flow. Specifically, personnel who are not using what they have studied and who are not using their skills are shifted to jobs suited to their special training and to units in which they can exercise their specialties. The personnel of units with strong technical forces are shifted to weak units. The technical forces of units under the system of ownership by the people are shifted to units under collective ownership. Those who respond to the advertisements are sent from the unit that advertised the positions to the Personnel Bureau for investigation and determination as well as discussion of transfer with them. Persons in jobs

suited to their training, persons who are backbone cadres in their own units or personnel in units with comparatively weak forces are generally not interviewed for transfer. This assures the rationality of the direction of flow of job advertising.

3. Selection of the best for employment. Units who advertise for personnel subject the required personnel to rigorous examinations in accordance with specified conditions. Of those who pass the examinations, the best are selected for employment. For example, when they advertised for personnel specialized in pattern design, they gave them an examination and they selected the best of those who passed the examination. From more than 200 persons who responded, they selected and employed 19 persons, selecting only one out of every ten and thus guaranteeing the quality of the personnel employed.

4. Making overall plans and taking all factors into consideration and giving consideration to the requirements and the interests of both the individual responding to the advertisement and to his unit. Most personnel who respond to job advertisements do so out of a desire to contribute more to building the four modernizations. However, there are among them some who respond to the advertisement for various motives and concrete analysis must be made of their way of thinking. We cannot without exception consider them to be working from selfish ideas and personal considerations and throw them out the door. In the course of advertising positions and determining and employing individuals for them in Changzhou City, consideration is given to their rational demands as much as possible at the same time that a conscientious job of ideological education is carried out. Agreement is reached on employment of all those who satisfy the conditions of employment as advertised and also to those who would benefit by being able to bring their special skills into full play. At the same time, conscientious consideration should also be given to certain of the rational demands of the original work units of those who respond to the advertisements and they should be assisted in resolving these questions. For example, staff and workers under the system of ownership by the people are all recruited in accordance with labor quotas determined by the state. Therefore, it is rational that the original units from which the individuals are recruited to propose supplementing their labor quota requirements. The Personnel Department and the labor departments are then resolute in making adjustments and supplementations.

The greatest resistance encountered in job advertising is the idea of qualified personnel "being the possessions of their units." In the processes of consultation, transfer and employment, there are some units of those responding to the advertisements who hold on to them even though they do not have a legitimate reason. In order to solve this problem, they started with the interests of the whole and adopted firm measures. In "Supplementary Views on Reform of the Specialized and Technical Cadres Administrative System," which has been approved by the municipal government, it is clearly stipulated: The original work units of all specialized and technical cadres who have been recruited by advertisement and employed and who have been transferred to jobs suited to their special training should support their execution, and, if they do not have a legitimate reason, they should not bar the way. The higher



level personnel department can cancel its administrative and wage relationships with the original unit and can introduce the individual directly to the new work unit and post so that he can go to work. His seniority will continue to be calculated and other treatment will not be affected. This provision breaks the shackles of qualified personnel who are the "possessions of their units" and has opened up channels for rational mobility of qualified personnel.

Practice demonstrates that implementing job advertising with leadership and organization and within a fixed scope is an effective measure for opening up all avenues for people of talent and activating science and technology personnel administrative work. It is beneficial to readjustment of the national economy and selecting and transferring urgently needed, useful qualified personnel. It is advantageous to discovering qualified personnel, to rational exchange and use of scientific and technical personnel and to arousing and using the socialist initiative of the units and the of the personnel that respond to recruitment.

Second, they opened all avenues for people of talent, made exceptions by employing persons who had acquired skills through self-study and encouraged young people to acquire skills through self-study.

The comrades of the Chengzhou Municipal Personnel Department recognize that encouraging young people to acquire skills through self-study is an important strategic issue for the Party Central Committee and for the State Council in order to encourage the vast body of young people to resolve to acquire talent in accordance with national conditions. It can not only encourage the vast body of young people to study diligently so that qualified personnel can be developed quickly and in large numbers but it also gives a major impetus to furthering a transformation in the social atmosphere and healthy growth and education of young people and to reforming the personnel system. For this reason, Changzhou City has on the one hand actively created the conditions for self-study by young people, and, on the other hand, also correspondingly established a system of examinations and selection of the best for employment so that the call of the Party Central Committee and the State Council can actually be implemented.

Within the scope permitted by Party and state policies, they made the following stipulations setting out from actual conditions in Changzhou City. All specialists in any field who are working, regardless of the kind of organization they belong to, can be recommended by their units or can recommend themselves for work in specialized and technical posts in which they can exercise their special skills. Persons who have developed skills through self-study and who do not belong to cadre organizations, can, on the basis of actual requirements and by approval of the municipal government, be employed and assigned after having passed a unified group examination given by the municipal personnel department. On the basis of these provisions, Changzhou City has already employed 47 persons who have acquired skills through self-study. Thirty-three of these have been employed as the result of job advertisements for the textile industry.

There are already more than 1000 scientific and technical personnel in the city who have been given professional titles and who acquired their skills through self-study. This amounts to 20 percent of the present science and technology corps. Employed persons who acquired their skills through self-study have had a great influence on the broad group of young people in Changzhou. They see that there is hope and that there is something to strive for. This acts a powerful stimulation for them to keep to their self-study and for enthusiasm for arduous study. One after another they come to inquire at the personnel department not once or twice but whenever job advertisements are regularly made on the basis of requirements. The Changzhou Municipal Personnel Bureau is now studying and adopting relevant measures and is gradually developing a system.

Third, they have implemented an integrated method of organizational assignment and "individual job selection" in the assignment and use of specialized and technical personnel

What we refer to as "individual job selection" is not an encouragement of scientific and technical personnel to select their occupations on their own apart from their organizations. Rather it involves assignment and adjustment to suitable posts on the basis of the principles of application of one's studies and using people's skills to the full, conscientious solicitation of the opinions and requests of scientific and technical personnel, and, on the basis of requirements, taking the individual's specialty, special skills and superior points into considerations as much as possible.

When specialized graduates of universities and middle schools are assigned, the personnel departments conscientiously solicit the views of the graduating students on the field in which they wish to be assigned. The views that they set forth are conscientiously studied and assignment is carried out in a rational and timely way. Even after a person has been assigned, the personnel department will still allow him to ask for a transfer and will satisfy rational demands if his unit is not making full use of his talents.

When the assignment of a person to a work post is not suitable or when little work is assigned, the individual is permitted to look for and select units and posts within the city that are suited to his special talents. An individual can also present requests and reasons for work transfer to organizations and personnel departments for promotions up one grade or skipping grades. This provides organizations, personnel departments and units employing people with procedures for joint examination and verification and management of work transfers. Since 1979, 46 scientific and technical personnel have been transferred in the city as a whole simply from accepting proper requests by letter of visits. This has resulted in these persons working in jobs suited to their skills and in their using their skills.

Fourth, they replenished and strengthened the leadership forces and scientific and technical forces of enterprises under collective ownership

Changzhou City now has 255 enterprises under collective ownership with a value of output amounting to 26.1 percent of that of the city as a whole. However,

there is a very great lack of scientific and technical cadres amounting to only 0.8 percent of the total number of staff and workers. Many units to date still do not have a single university graduate. This hinders and limits the development of industries under collective ownership. The principal reason for this is differences in political and economic treatment of cadres between enterprises under the two types of ownership of ownership by the people and collective ownership. This has affected the transfer of scientific and technical personnel from enterprises under ownership by the people to enterprises under collective ownership.

In order to bring about a rapid change in this situation and to stimulate the development of the collective ownership economy, the city clearly stipulated the following in 1979: Equal treatment without discrimination politically of cadres in units under collective ownership and of cadres under the system of ownership by the people. In the economic sphere, preferential treatment was accorded pursuant to work investigation in respect to such actual problems as allocation of housing and resolution of concrete problems. In this way, cadres in a portion of the enterprises under the system of ownership by the people were drawn into units under collective ownership. Since 1979, 231 scientific and technical cadres from the citizenry as a whole have been allocated to units under collective ownership in the city.

Fifth, they instituted integrated and management and concentrated use of some scientific and technical cadres who were not being regularly used

"Large and complete" and "small and complete" are another manifestation of "unit ownership and department ownership" of qualified personnel in the use of scientific and technical personnel. On the one hand, scientific and technical personnel of which there are limited numbers and in specialities that are not commonly used such as foreign languages, building (not including building departments), boilers and heating and ventilation are dispersed into more than 100 units in which they often lack regular assignments with the result that they are idle and in over supply. This creates a serious waste of qualified personnel. On the other hand, many units have urgent requirements for qualified scientific and technical personnel with the aforementioned skills in certain assignments. In order to bring these scientific and technical personnel with uncommonly used skills into full play and in order to deal with the practical requirements of certain units, the Changzhou Municipal Personnel Bureau, with the approval and support of the municipal government, decided to gradually absorb scientific and technical personnel in various grass-roots units who were not being regularly used into higher level organizations such as companies and general plants, applying integrated management, allocation and use. After integrated management and concentrated use were implemented, this group of personnel still belonged to the enterprise organization and their treatment in terms of wages, welfare and bonuses was the same as that of personnel employed in enterprises.

This reform clearly increased the beneficial results of use of qualified personnel and was equivalent to the city as a whole having added several hundred scientific and technical personnel, with the shortage of scientific and

technical personnel in certain specialities having been made up for. Let us take the Changzhou Chemical Industrial Company and the Textile Industrial Company as examples. These two companies are places in the city that use boilers in a comparatively concentrated way. Altogether, they have 107 boilers. However, they have only 21 scientific and technical personnel specialized in boilers (including recently assigned graduates of technical secondary schools). If there is decentralized administration, then 98 persons must still be allocated. This cannot be met by the forces of Changzhou City. However, if this measure of reform is adopted and scientific and technical personnel specialized in boilers are put under integrated management and concentrated use, the existing forces will be able to take on the technical and management tasks of these two companies.

The preliminary reforms that Changzhou City has carried out in regard to its science and technology personnel administrative system demonstrates that, in this region, it is feasible for a department to carry out reform of the personnel system. They have provided a number of useful experiences for systematic reform of personnel systems in the future.

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## APPLIED SCIENCES

### CHINA'S FIRST PROTON LINEAR ACCELERATOR PERFORMS WELL DURING TRIALS

Beijing KEXUE SHIYAN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 83 pp 1-2, front cover

[Article by Pan Huibao /3382 8409 1405/]

[Text] The construction of China's first proton linear accelerator was completed at the Institute of High Energy Physics of the Chinese Academy of Science. At 3 am on the morning of 12 December 1982, a proton beam with a energy level of 10 million electron-volts and a pulse current of 14 mA was generated for the first time. This accelerator is named the "Beijing Proton Linear Accelerator," abbreviated simply as "BPL." It represents a new level of achievement in the development of accelerators in this country.

Particle accelerators are commonly referred to as simply accelerators. They can be classified into several categories: in terms of the types of particles, there are electron accelerators, proton accelerators, and ion accelerators; in terms of the principle of particle acceleration, there are high-voltage type accelerators (e.g., electrostatic accelerators, high-voltage multiple accelerators, high-frequency, high-voltage accelerators, and insulated-core transformer type accelerators), linear accelerators, induction accelerators, cyclotrons, synchrotrons, and various types of particle collision devices; in terms of the energy levels of the particles, there are low-energy accelerators, intermediate-energy accelerators, high-energy accelerators, and ultra high-energy accelerators.

The first accelerator in the world was built back in the 1930's; at that time, protons could only be accelerated to an energy level of several hundred thousand electron-volts. Today, the proton energy level can reach 500 billion electron-volts. It appears that the energy level had increased by an order to magnitude every 10 yeras, which is an astonishing rate of development. To construct a high-energy accelerator requires a large amount of human and material resources; it also depends on the achievements of many high-technology sciences. The Western Europe Nuclear Research Center (CERN) organized by 12 European countries spent as much as 1.4 billion Swiss Francs in constructing the 400 billion eV proton synchrotron. This project also stimulated the development of many advanced technologies and industrial production in Western Europe.

The development of accelerators in this country began after the establishment of the People's Republic. In 1958, China built the first proton electrostatic

accelerator capable of accelerating protons to an energy level of 2 million eV. Since that time, a variety of accelerators including proton cyclotrons, electron induction accelerators, and linear accelerators were developed. These accelerators have made significant contributions to the development of socialism in this country.

#### An Important Member

The proton linear accelerator is an important member of the family of accelerators. It accelerates protons by using an electric field generated by a high-power, high-frequency emitter.

Fig 1 shows a schematic diagram of this type of accelerator. Suspended inside a cylindrical metal tube are a series of accelerating electrodes called the "drift tubes"; the space between each pair of drift tubes forms a small resonance chamber. When excited by a high frequency electric source, an electric field is generated across the gap between the drift tubes; the magnitude and direction of this electric field vary periodically with time. At the center of the drift tube is a circular hole through which the proton beam can pass. If the protons passing through the gap happen to encounter an electric field with forward polarity, then the positively charged protons will be accelerated; otherwise they will be retarded. Therefore, the accelerator is designed such that the protons are accelerated every time they pass through a gap; during the remainder time period they simply coast in the drift tube. In this manner, the protons are continuously accelerated while traveling from the entrance to the exit of the accelerator. Since the accelerated protons can reach extremely high speed in a high vacuum chamber, it is clear that in order to achieve the desired performance, very strict design and manufacturing requirements must be met.

Proton linear accelerators have certain unique features such as high intensity beam, high power, and ease of beam generation. This type of accelerators are primarily used as injection devices for modern high-energy accelerators; they are also beginning to play an important role in low energy and intermediate energy applications.

Significant progress in modern proton linear accelerators was made during the 1970's. In the United States, three intermediate-energy proton linear accelerators were built. Two 200 MeV (Note) accelerators were constructed respectively at the Fermi National Accelerator Laboratory (FNAL) and the Brookhaven National Laboratory (BNL); they were both used as injection units for a high-energy proton synchrotrons. At the Los Alamos Scientific Laboratory, a 800 MeV proton linear accelerator called the Meson Production Factory (LAMPF) was built; it was primarily used for scientific research related to national defense. Also, a 50 MeV proton linear accelerator was built by the Western Europe Nuclear Research Center (CERN), and a 20 MeV accelerator was built by the Institute of High Energy Physics (KEK) in Japan; both were used as injection units. Recently the New England Nuclear Corporation developed a 45 MeV proton linear accelerator specially for producing isotopes for medical use.

The first proton linear accelerator built in this country (BPL) was originally intended to be used as an injection unit for a 50 GeV proton synchrotron; now it is being used primarily for scientific research. At present its energy level is 10 MeV; next year it will be upgraded to reach 35.5 MeV. The BPL was designed and built by Chinese scientists and technicians. Its technical standard is comparable to the international standard of the late 1970's. Its completion won praise from scientists both at home and abroad.

### Main Components

The BPL is a large and complicated machine. It is composed of the following components: the injection unit, the low-energy beam transport system, the accelerating chamber, the high-frequency system, the magneto-electric source, the vacuum system, the water cooling system, the beam measuring system, the computer control system, and the dosage monitoring system.

The injection unit is actually a high-voltage multiple accelerator with an energy level of 750 KeV. It is the best high-voltage multiple accelerator in the country in terms of energy level and stability; its stability is 0.05 percent.

The injection unit has three main segments: the high-voltage generator, the ion source, and the accelerating tube. In the high-voltage generator, a high-voltage transformer is used to convert the 5-KHz power supply into a 100 kilovolt source, which is in turn used to charge a condenser in a voltage multiplier to produce a high voltage source with 850 kilovolts output under no-load conditions. The automatic voltage stabilizing system maintains this voltage at a steady value.

The ion source is a device which produces proton beams. It has many different types. The one used by the BPL is a dual plasma ion source in which hydrogen ions are extracted from the plasma surface to produce the required protons.

The accelerating tube in the injection unit is a 2-m long cylinder made of ceramic rings and titanium alloy segments; it has an inner radius of 600 mm and is designed to withstand 750 kilovolts. The proton beam from the ion source is accelerated as it passes through the accelerating tube.

The entire injection unit is contained in a three-story building; the building is shielded with aluminum plates to avoid interference to nearby equipment during the high-voltage discharge.

After leaving the injection unit, the proton beam must pass through a low-energy beam transport system, where the beam is focused and its properties are improved, before it enters the accelerating chamber.

The accelerating chamber is the main section of the proton linear accelerator; its function is to accelerate the proton beam. The 10 meV cylindrical accelerating chamber is 7.27 m long, and is made of a copper-steel composite material, developed specially for BPL by the Ministry of Metallurgy. The 20-mm thick composite material contains 4 mm of highly conductive oxygen-free copper, which requires a special technique for welding. The chamber construction requires high precision tubing and sophisticated machining techniques.

Inside the chamber are 57 drift tubes each equipped with a four-pole magnet for focusing the beam. The drift tubes are manufactured using such new technologies as vacuum welding and electron beam welding; their construction requires high-precision machining as well as assembly procedures, otherwise the high speed proton beam may hit the tube walls.

The chamber also contains other important parts such as the tuner for tuning frequency and electric field distribution, the coupling rod for stabilizing the electric field, the high-frequency monitor ring, the ceramic high-frequency power input window, the exhaust port for evacuation, etc.

The emitter which supplies high-frequency power to the accelerating chamber has a power output of 5 megawatts and a frequency of 201.25 MHz. In order to maintain stability of the high-frequency field, a servo automatic control system is used to control the frequency, amplitude, and phase of the emitter output.

Each four-pole magnet in the accelerator must have its own pulse-operated, highly stable electric source. The 95 power supply units must operate in synchronization.

The control and tuning functions of the BPL are performed by computers. The individual components of the accelerator are connected to the computer in the central control room; their operating conditions and parameters can be instantly displayed on the color screen. Thus, technicians can readily understand, monitor, and adjust the operating conditions and parameters from the control console.

In addition, vacuum systems, water cooling systems, beam measuring systems, dosage monitoring systems are also essential segments of an accelerator.

#### Future Applications

The primary motivation for various countries to develop high-energy accelerators is to explore the secrets of matter and to gain a better understanding of its fundamental structure. Through the use of high-energy accelerators, scientists are able to study the microscopic world. Furthermore, because accelerators can produce high-energy particles and high-intensity radiation, they are used as radiation sources in a variety of applications. In today's world where atomic energy is widely used, it is safe to say that accelerators have applications in almost all aspects of the national economy.

At present low-energy accelerators have already been produced commercially; there are several thousand accelerators being used in factories, hospitals, and research organizations. In this country, more than 10 hospitals are equipped with electron linear accelerators and electron induction accelerators; accelerators are also playing important roles in industry, agriculture, and commerce.

The BPL serves a useful function in producing short-life isotopes for medical diagnosis. Initially, scientists are planning to produce the gallium-67 and

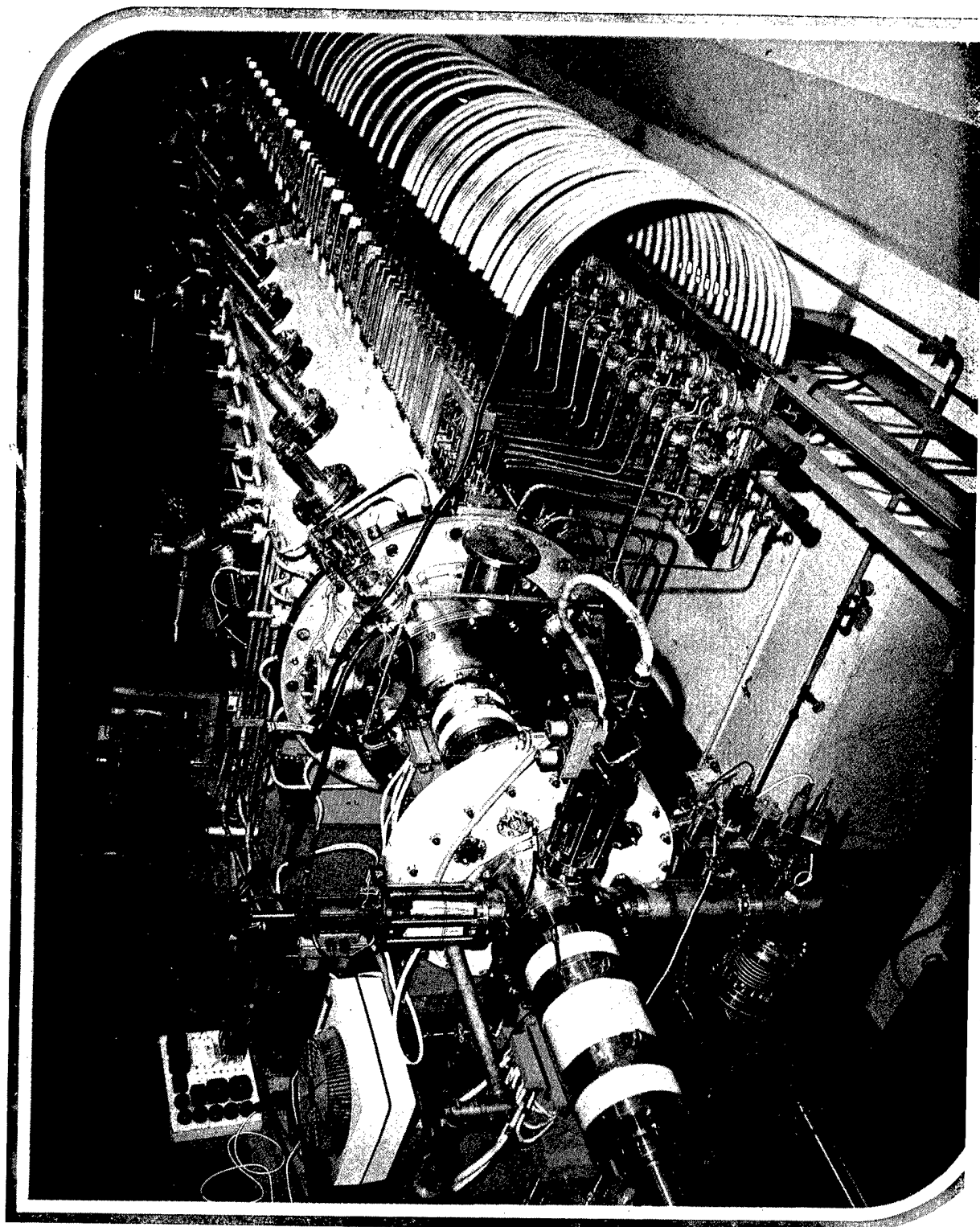


thallium-201 isotopies at an estimated annual rate of 50 curies. When the energy level of this accelerator reaches 35.5 MeV, it will be able to produce more than 20 medical isotopes.

At the present time, most cancer patients must undergo radiation treatment which generally consists of X-rays,  $\gamma$ -rays, and electron beams. But it has been suggested by the medical community that a more effective treatment would be to use neutrons, protons, and  $\pi$  mesons. Therefore, efforts are being made to develop this type of facility.

Since 1976, the Fermi National Accelerator Laboratory of the United States has made significant progress in medical research using neutrons produced by 66 MeV proton beams. They are currently planning to add a second 35 MeV proton beam to produce neutrons for tumor treatment. In this country, there is currently no work being done in these areas. Once the expansion of the BPL is completed, its 35.5 MeV proton beam can produce neutron beams with an average energy level of 20 MeV. According to calculations, its dosage rate can reach 92 rads per minute. This facility not only will fill one of the voids in this country, its performance will be comparable to those of other countries. Chinese scientists and technicians are making a concerted effort in producing fast neutrons which can be used to provide a new weapon in the battle against cancer.

The BPL is only a beginning, there is a great deal more work to be done. The development of this accelerator not only provides us an opportunity to learn many advanced technologies, but also demonstrates the high technical standard and capability of Chinese scientists and technicians.



China's first proton linear accelerator

3012  
CSO: 4008/98

## APPLIED SCIENCES

### STRATEGY FOR COMPUTER DEVELOPMENT EXAMINED

Beijing ZIRAN BIANZHENGFA TONGXUN [JOURNAL OF DIALECTICS OF NATURE] in Chinese Vol 4 No 6, Dec 82 pp 3-5

[Article by Wang Xinggang [3769 5887 0474], Institute of Computer Technology, Chinese Academy of Sciences: "Some Views on Computer Development in China"]

[Text] 1. Priority Development of Computer Applications

In the 1950's we moved from imitation to development of computers, and certain tendencies have persisted ever since: an overemphasis on hardware and neglect of software, an overemphasis on mainframes and underemphasis on peripherals and components, an overemphasis on research and design and an underemphasis on processes and production, and an overemphasis on applications testing and an underemphasis on applications effectiveness. As a result, for some time our computers have been unreliable, incomplete in configuration, difficult to use and maintain, and made in a wide range of varieties, differing only in small details, which are not being produced in lots, and development has been slow. Experience shows that this is not a healthy developmental strategy.

To thoroughly correct this situation, we must deal with the root of the problem. The objective of computer development is applications: we do not develop computers for their own sake. The problem consists in the lack of a correct and thorough understanding of this fact.

At present and in the near future, we should start by organizing a contingent (including social scientists) to study paths and strategies for the development of computer applications in China, including identification of the areas that merit high priority, economic benefits, market forecasting, social effects and the like. Only by making clear our country's situation and actual needs in the process of the four modernizations will it be possible to achieve sound development of computer technology.

The computer applications field is an independent field of study in itself. Improving the utilization of computers is not easier than improving the quality of computer manufacture. But improving the quality of computer applications will rely more on people's mental labor and less on the

industrial quality of materials and processes, and will require smaller investments. In reference to China's current situation, giving priority to the development of computer applications will take advantage of strong points and avoid weak points, will yield results rather quickly, and in addition will provide a motive force for the development of the computer production industry.

The several hundred large-and medium-sized computers and nearly 10,000 microcomputers which we have imported to date have not been effectively used, which indicates the urgency of improving the quality of computer applications. Actually, in view of the state of China's economic development and its scientific-technical and management standards, the main current problem is not the lack of large-scale computer production, but inability to utilize small lots of computers. We lack software personnel, applications research is carried on by individual organizations, and there are very few organizations which serve computer users. All of these facts indicate that if we do not shift our strategy and readjust the industrial structure to focus it on computer applications, we will not be able to bring about major improvements in the situation.

If we examine the whole situation we will discover that, with a focus on applications, the computer industry includes two major areas, computer production and computer services (also called the data processing industry). The proportion between these two industries in the United States in 1979 was 2.7 to 1, while the computer services industry has not yet developed in China. This structural deficiency greatly hinders the development of computer applications, and we must take steps to set it right.

Therefore, on the one hand we should establish new computer service companies, including the development of computer leasing and maintenance, provide consultations, carry on software contracting, increase machine time and network time, provide data base services and the like. In addition, if some (but not all) computer centers and stations can improve their associated departments' management systems and methods and orient them to serving society, they will evolve rapidly into the mainstay of China's computer services industry. This involves small investment and will give a considerable return.

In order to promote the development of computer applications, we must use economic measures to promote commercialization of software, because only this will make it possible to orient software to social development and social service. We must thoroughly correct the current situation in which individual plants or users develop their own applications programs, decrease duplication of labor and increase society's wealth of intellectual products.

China's planned-economy model is like that of many developing countries, and applications software suited to the planned-economy management model is likely to be widely applicable in developing countries. This is a latent international market which the western developed countries look down upon. China both needs and has the potential to develop this type of software

product, as well as the potential to develop a software market for the developing countries, which would help them to throw off the exploitation by the multinational corporations.

In the long run, if we can thoroughly utilize China's advantages of rich manpower resources and low wages, it will be entirely possible to train a hardworking, intelligent software contingent which will constitute a new force in the international software business.

## 2. Focus on Microcomputers, Minicomputers, Special-Purpose Computers and Distributed Systems

International computer development has revealed the law that because the computer development industry's expenses are very high, the governments of many countries have made great efforts to foster topflight computer industries: International Computers Limited (ICL), Siemens and the like developed in this way. China has nowhere near the investment capabilities of England, France, and West Germany, and it has scattered them in a large number of organizations. If this situation is not rectified, it will be very difficult for our computer industry to develop and mature rapidly. Only by concentrating China's effort on developing a small number of key enterprises and gradually specializing them and forming them into consortiums will it be possible to develop large-scale production capabilities, increase quality and decrease costs in large-scale production. We must not be satisfied to stop at the handicraft workshop level.

In view of the funds and management quality of our enterprises, at the moment we must rely primarily on cheap, reliable, easy-to-use micro- and minicomputers to expand computer applications, and put an effort into developing special-purpose computers and distributed systems to meet more demanding applications requirements. Taking this path will allow us to start at a technically advanced level (particularly if we start from micro-computers); we will be going along with the tendency for computer applications systems to move from the centralized to the distributed form; we will have a rather good performance-to-cost ratio (special-purpose computers generally have certain specific strengths); and applicability, reliability and prospects for wide use will all be rather good. In addition, microcomputer software still has not developed fully, and there is a great potential market. We have inherited a limited foundation and few burdens and are able to travel light; we are in a position to catch up and develop our own characteristics in computer development and the application of micro- and mini-computers, special-purpose computers and distributed computer systems.

Further progress in large scale integrated circuits (LSI) and very large scale integrated circuits (VLSI) is sure to make the prices of products and components on international markets drop steadily. With the current limited demand for computers in China, it is feasible to buy components abroad to build microcomputers, minicomputers or special-purpose computers, or to buy the micro- and minicomputers themselves and assemble multicomputer systems or local networks. Currently, most of computer hardware costs are for peripherals: a printer costs twice as much as a microcomputer, and floppy

disk or hard disk units are more expensive still. The central processor accounts for less than 5 percent of the component cost of a microcomputer. Obviously, when developing microcomputer or minicomputer systems, we should focus on the development of peripherals and organize a contingent to attack this problem. Importing components and assembled systems is not only economically beneficial at present, but will be feasible for some time to come. Actually, thinking focused on central processing units has long since been out of date.

General-purpose computers are the types with the greatest value on the international market. While focusing on developing micro- and minicomputers, China must of course not neglect to develop general-purpose computers and a small number of very large computers and supercomputers. When developing general-purpose and special-purpose computers, attention must be given to applications, and emphasis must be placed on continuity and software compatibility.

It is difficult to arrange software compatibility with foreign products; it may be better to adopt the approach of Chinese-foreign joint capital ventures to produce compatible computers.

### 3. Strengthen Management and Stimulate Consulting Activity by Specialist Groups

We must strengthen management of computer import, protect our national industry, and spend no foreign exchange on what we do not need. In import projects, not only should we carry out a technical investigation before import, but following import we should investigate the actual effects realized every year. We must develop economic management regulations, exercise oversight over import projects, and institute rewards and penalties, for only in this way can we put a stop to blind importation and achieve economic results.

We should institute a strict examination and authorization system for the distribution of funds for domestic research and production. Once the work has gotten under way, not only should we carry out technical feasibility studies, but in addition we should investigate whether the specified technical and manpower conditions have been followed. Evaluation of results should be based on real applicability. The entire task procedure should be on a contract basis with bonuses and penalties (such as deductions from the participants' wages!). We must avoid competition for assignments followed by an inability to complete them and waste of financial and labor resources, which have a negative effect on work.

We have already developed a computer research and design force, and we must encourage it to work hard and show a creative spirit. In the area of micro- and minicomputers, special-purpose computers and distributed systems, in information processing using Chinese characters, in computer software, in computer science research and the like, China's scientific and technical personnel are quite capable of making themselves a new force to be reckoned with; and we must not underrate our capabilities.

Expanding international cooperation is an effective method of catching up. We should not neglect flexible, mutually beneficial international cooperation in such areas as computer production, parts, peripherals, software, and training. It is not easy for an academic society to engage in business, but if it does not, it will suffer losses and cause a loss to the nation. We should also step up consulting activities by the computer organizations in the academic departments of the Chinese Academy of Sciences, the Computer Society and similar academic groups in order to make suggestions and propose policies for the four modernizations. All consultant groups should be upright and honest, for only in this way will it be possible for them to play a major role through strengthening of leadership at all levels and intensified technical management.

8480

CSO: 4008/72

## APPLIED SCIENCES

### UNESCO-SPONSORED COMPUTER COURSE IN BEIJING

OW302148 Beijing XINHUA in English 0725 GMT 30 May 83

[Text] Beijing, May 30 (XINHUA)--A four-week training course on system design and on-line information retrieval, jointly sponsored by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Information Retrieval Service of the European Space Agency (ESA/IRS) and the Institute of Scientific and Technical Information of China (ISTIC), opened here this morning.

The course is arranged according to a cooperation agreement signed between UNESCO and ISTIC in 1981.

About 100 technicians engaged in computerized information retrieval from all parts of the country are attending the course, focusing on method of system design, telecommunications technology and theory and practice of information retrieval. Three specialists sent by the ESA will give lectures.

During the course, the participants will be given an on-line information retrieval demonstration and a practical chance of access to international data bases through terminal equipment installed in Beijing.

The terminal equipment and telecommunication facilities provided by the UNESCO and the Italcable which are to be used at the course will be kept in China for the setting up of an international terminal station linked up with the ESA's Information Retrieval Service and the U.S. dialog system. Starting in July, the ISTIC will provide Chinese users with service for retrieving scientific documents and data in Europe and the U.S.

Speaking at the opening ceremony, Lin Zixin, director of the ISTIC, said that the course would be a new starting point for the development of China's international on-line information retrieval, and will help the participants enrich the knowledge in system design and on-line retrieval, promote China's modernization of scientific and technical information work as well as the country's international cooperation in the field.



UNESCO official K. Roberts and software specialist G. Muehlhauser of the ESA also spoke at the ceremony.

Present on the occasion were officials from the China National Commission for the UNESCO, the State Science and Technology Commission and the Ministry of Posts and Telecommunications.

CSO: 4010/66

## APPLIED SCIENCES

### IRRDB SYMPOSIUM HEARS REPORT ON HAPLOID TREE

OW191158 Beijing XINHUA in English 1118 GMT 19 May 83

[Text] Beijing, May 19 (XINHUA)--Chinese scientists have scored what may be a scientific first by growing a haploid rubber tree from anther cultured in a test tube. The tree is now 6 meters tall, and tapping of latex is expected to begin next year.

This report was made to a symposium of the International Rubber Research and Development Board in Beijing by Chen Zhenghua, associate professor of the Institute of Genetics under the Chinese Academy of Sciences. The symposium was attended by experts and scientists from eight countries.

Associate Professor Chen said that she and her colleagues cultivated the rubber plantlet in a test tube from anther culture in 1977. Anther is the part of the stamen of a flower that bears the pollen. The sapling was transplanted at the Tropical Crop Research Institute on Hainan Island in 1979.

It is called a haploid rubber tree since the number of its chromosome is half that of an ordinary rubber tree.

Since then they have obtained such haploid rubber plantlets from six genotypes or clones of rubber trees and the success rate has increased year by year. In 1977, the rate of success was 0.05 percent. In 1982, it rose to 3 percent, that is, they obtained three rubber plantlets from every 100 anther cultures. The survival rate of the saplings after transplanting has also risen.

Chen Zhenghua read her paper, "Anther Culture Techniques of Rubber Trees," at the symposium and also showed slides of the transplanted rubber trees growing on Hainan Island.

She said that the successful breeding of rubber trees by anther culture has made it possible to develop rubber trees of pure lines in several years while by conventional method of seeding, it would take about 100 years. These experiments will also be the basis for obtaining hybrid rubber plants in the future.

CSO: 4010/71

APPLIED SCIENCES

PRC SCIENTIST ADDRESSES IRRDB SYMPOSIUM CLOSING

OW191154 Beijing XINHUA in English 1103 GMT 19 May 83

[Text] Beijing, May 19 (XINHUA)--Chinese scientists have worked out a new way to predict the potential yield of mature rubber trees in the nursery, that shortens their breeding period and facilitates the breeding of new varieties.

Zheng Xueqin, associate professor of the South China Academy of Tropical Crops (SCATC), reported the find at an International Rubber Research and Development Board [IRRDB] symposium which closed in Beijing today.

Professor Zheng said the new method combines two procedures. In the first, an incision is made on a leaflet and the amount of latex exuded and duration of latex flow from the veins observed. In the second, a leaflet is detached from the stalk. The leaf blade and the latex exuded are then dried, and their weights determined.

Zheng explained that the leaflet could basically reflect the yield of a tree. With the new method, varieties could be selected with an accuracy rate of about 80 percent, he said.

He added that conventional prediction methods use rubber plantlets at least two years old, while the new way uses one-year-old buddings, saving much time. He said this would also make it easier to determine the quality of new varieties, and help to shorten their breeding period.

Professor Zheng began his research in 1973 together with other Chinese experts. His new method has been widely adopted in China's rubber producing areas. He also tested his method on a number of rubber varieties in November 1982, while attending an international conference in Malaysia. It proved to be quite effective, he said.

Zheng is in charge of the SCATC genetical breeding research laboratory on Hainan Island in South China.

CSO: 4010/71

## APPLIED SCIENCES

### MOUNT NAMJAGBARWA SURVEY YIELDS GOOD RESULTS

Beijing RENMIN RIBAO in Chinese 20 Apr 83 p 3

[Article by Zhang Cailong [1728 2088 7893]: "Results Obtained From Survey of Mount Namjagbarwa"]

[Text] It was revealed in the Chinese Academy of Science work conference on the scientific survey of Mount Namjagbarwa that Chinese scientists have obtained a wealth of information from their survey of Mount Namjagbarwa.

From August to October 1982 and from February to April 1983, the Chinese Academy of Science has twice organized scientific survey teams to conduct general survey of the Namjagbarwa area. The survey activity included geology, geomorphology, natural geography, botany and animal science.

The survey showed that there are vigorous geological structural activities in the Mount Namjagbarwa area and it is an ideal place for geological studies. There are 3-4 earthquakes per year in this area that registered 4-5 [on the Richter scale]. In the 1920's British explorer Wood had seen two large waterfalls with over 10 meters of head drop on Yalutsangpu River in the Big Bend Canyon, but they have now disappeared. On the western slope of Mount Namjagbarwa, scientists have also discovered seasonal oceanic transit glaciers. This discovery is a first in China. The glacier stretches out in six sections from the mountain peak through dense virgin forests all the way to the bank of Yalutsangpu River with a total length over 10 kilometers. Based on the investigation and analysis, it was estimated that the glacier shifted every 20 years or so. When it moved, it moved up the mountain with great inertia and force and blocked rivers. Scientists believe that the formation of this type of glacier is intimately related to the slope of the glacier bed and has to do with the triggering of earthquakes.

New discoveries in the recent survey have corrected some of the old beliefs regarding Mount Namjagbarwa. For example, it was generally believed that Mount Namjagbarwa is the east end of the Himalayas and Yalutsangpu in the foothills is the joining seam of the earth crust plate structure. This survey revealed, however, the principal petrographic direction in the Mount Namjagbarwa area goes through the big bend in the lower reaches of Yalutsangpu River and continues eastward until it reaches the Jinzhuqu area more than one hundred kilometers down the line, and no evidence of rock mixing which should be present in a seam zone was found in Yalutsangpu River.

In this survey more than 40,000 plant and animal samples were collected, some are first discoveries in the world and some are first discoveries in China or on the Xizang plateau.

For example, preliminary evaluation of a parasitic rust fungus on rose plants has identified it as a new species in the world record. Four new species in the Chinese record were also identified.

9698

CSO: 4008/96

## APPLIED SCIENCES

### BRIEFS

COMMUNICATIONS SYSTEM TESTED--Shijiazhuang, 18 Apr (XINHUA)--The PCM [expansion not known] 480-circuit numerical microwave relay communications system designed and produced by China was successfully test-operated on 18 April between Shijiazhuang City and Xinle County, Hebei. This is one of China's important achievements in modernizing communications. This system is quite good in terms of transmission distance and it is interference-proof and secure. It is also able to process a variety of signals in its computer and analyze all kinds of complicated situations for application in economic, scientific and technical, military and other uses. All components of this system were designed and manufactured by our country. It can be used to transmit telephone calls, facsimile, telegrams, various data, radiophotos and color television. If only one signal is transmitted, the system can accommodate 450 telephone calls, or over 10,000 bits of data, over 60,000 telegrams and four picturephones. [By reporter Yang Shuxun] [Text] [OW270805 Beijing XINHUA Domestic Service in Chinese 1620 GMT 18 Apr 83]

MOUNT NAMJAGBARWA SURVEY--The Chinese Academy of Science will conduct the third large scale general scientific survey of Mount Namjagbarwa in southeast Xizang between June and September in 1983. The survey team will be made up by 50 researchers in 23 different fields and other associated personnel. A great majority of the participants are middle-aged intellectuals. New topics of investigation in this survey include atmospheric physics, earth physics, petrographical chemistry, environmental chemistry, metamorphic petrology and mud and rock flow. [Text] [Beijing RENMIN RIBAO in Chinese 20 Apr 83 p 3] 9698

CSO: 4008/96

## LIFE SCIENCES

### DIVERSIFICATION IN MEDICINE

Shenyang LIAONING RIBAO in Chinese 3 Mar 83 p 1

/Text/ Under the guidance of the line of the 3rd Plenum of the 11th Party Congress, the Public Health Department of the province investigated and implemented the public health organs and systems. Some delightful trends have appeared. One of these is the civilian operated joint clinic of Dadong District, Shenyang City. Under the current condition of not much investment from the State and the local public health budgets the method used by Dadong District to do a good job in public health affairs on the present foundation is worthy study.

The Department of Public Health is the one relatively profoundly influenced by leftist thoughts. The common illnesses are "monopoly, eating out of a common pot, cutting through /everything/ with one knife, and not making any accounting." The contradiction between the current disease prevention and treatment condition of the department and the needs of the masses of people remains the major problem of public health affairs. The reasons appear to be (1) little capital investment in public health affairs for a prolonged period of time. i.e. a proportional imbalance between economic development and public health development. (2) The Public Health Department itself is not completely liberated from the influence of leftist thoughts and is still bound by various old restrictions. The stride toward reform is not big and the management work cannot catch up. The current task is to start from the reality, to stress survey and research, and to proceed with orderly reform through model experimentation, so as to make the public health organization closer to the masses for their convenience to improve the quality of service, to meet the needs of disease prevention and control, and to make public health work develop its necessary function in the modernization and construction of socialism. This is to pursue a road of public health work suitable for the condition of China.

In order to speed up the development of public health affairs and resolve the problem of difficulty in obtaining disease treatment, all segments are aroused to be positive, to adopt many ways to construct public health system jointly. The necessity of long range coexistence of the three sectors of the State, the collective, and the individual enterprises in the socialist society should be acknowledged. While public health organizations of the whole people should continue to develop, collective public health structures should also be earnestly developed and medical practice by individuals should also be

permitted and supported. Practice has proved that collective health facilities require less capital investment, show benefits fast, and are convenient for the masses. With the development of production, the lives of the people improve and the demands for public health work by the masses continue to increase. The capabilities of the collective should be utilized to develop more public health facilities in order to satisfy the needs of the masses. The policy of allowing individuals to open medical practices should be conscientiously implemented to support positively those physicians who have been examined and certified to open their own practices, to organize joint clinics, or to practice medicine in drugstores. Midwives may take over the operation of delivery stations (or home delivery centers) nurses may open business of special nursing care, etc. so that all those who have medical and health care technical skills and those idled public health personnel who are willing to serve the people may be mobilized to serve the masses. The public health departments should manage them from time to time. It is not right to relax this management and it is also not right to use the excuse of stressing management for proceeding with interference and obstruction. This system of operating public health affairs in multiple forms is very good. It is a progress over the single form. We should confirm and support it.

6248

CSO: 4008/97



## LIFE SCIENCE

### PUBLIC HEALTH WORK IN SICHUAN CONTINUES TO MAKE PROGRESS

#### Report on Conference

Chengdu SICHUAN RIBAO in Chinese 8 Apr 83 p 1

/Text/ The Conference of Representatives of Advanced Collectives and Advanced Workers of Public Health in Sichuan Province was held in Chengdu on 4-7 April. It was attended by 832 advanced representatives of the public health battlefield of the province and those who participated in the Provincial Public Health Work Conference, a total of more than 1,200 persons. At the conclusion of this conference, commendations were awarded to 3,842 advanced public health collectives and 10,867 advanced public health workers chosen from the entire province.

During the conference, the delegates seriously discussed the report of Deputy Governor Liu Haiquan /0491 3189 2164/ and exchanged experiences; and 27 delegates made speeches. These model advanced workers reflect, in many different aspects, the good condition at the public health battlefield in the province. They form the models for all medical personnel to learn and provide good experience for reform and further improvement of public health work at the province's public health battlefield. All the delegates said /during the conference/ they learned, found the distance /for further striving/, and broadened their vision. They resolved to take up a position at the forefront of reform under the guidance of the spirit of the 12th Party Congress and with the spirit of shouldering the responsibility of the people's health to make new contributions to the creation of a new phase of public health work in the province and to produce still more achievements in safeguarding the health of the people.

The conference presented a book of proposals to all the comrades of the public health battlefield of the province to call upon the medical personnel to be firm in the faith of communism, to establish the thought of creating a new phase, to stand in the forefront of reform, to belong to the faction promoting reform, to foster good medical ethics and medical custom, to participate earnestly in the construction of spiritual civilization, to use Jiang Zhuying /5592 4639 5391/ Luo Jianfu /5012 0256 1136/ Zhou Lirong /0719 4409 2837/ and Zhang Haidi /1728 3189 6611/ as models to continue to march forward with enthusiasm and wholehearted cooperation.

Members of the Provincial Committee, the Provincial Advisors' Committee, the Provincial People's Congress, and those in charge of the provincial government and members of the Central Advisors' Committee who were in Chengdu issued the certificates of merit and records of honor to the advanced collectives and the advanced workers during the concluding ceremony of the conference. Certificates of merit were also issued to the representatives of the 44 units who won the medical science research awards from the Provincial People's Government and the Department of Public Health. Those who are in charge of the related departments of the province, famous persons of the public health field, and representatives of medical personnel also attended the concluding ceremony yesterday. Nie Ronggui /5119 2837 6311/, Deputy Secretary of the Provincial Committee spoke for the Provincial Committee.

#### RIBAO Commentary

Chengdu SICHUAN RIBAO in Chinese 8 Apr 83 p 1

/Text/ The most urgent task in public health work is for all levels of public health cadres and the rank and file public health personnel to create a new situation in public health work according to the policy of the party and to do a good job of reform.

Since the liberation, gigantic achievements have been obtained in public health affairs to make great contributions to the health of the people and the prosperity of the nation, but the Department of Public Health is also the one that is deeply influenced by leftist thoughts. The influence is especially reflected in the form of practicing medicine. The operation relies solely upon the State, breaking away from the reality of coexistence during the period of socialism of the three types of ownership systems by the whole people, the collective, and the individual. With regard to management, too much that is taken over is unified to death; economic benefits are not emphasized, fostering eating out of a big pot," and egalitarianism. With regard to work methods, the difference in conditions of all-the-people units and the collective is not distinguished, one solution is used for all problems. With regard to the system of charging fees, public health work is one-sidedly stressed as a welfare enterprise thinking that the lower the fee, the more that is exempted, the better it demonstrates the superiority of socialism to the extent that the longer medical treatment and public health units are operated the poorer they become. These maladies suppress positiveness in the vast number of public health workers and prevent public health affairs from being developed even better.

Since the 3rd Plenum of the 11th Party Congress, under the inspiration of the reform of the operation and management system of agriculture, the public health work in Sichuan has been reformed and obvious results have been obtained. Through trial implementation, with the support of the State of the method of "independent accounting, individual possibility for profit or loss, distribution according to labor, and democratic management," we have implemented diversified forms of medical practice, centering upon contracts and a system of responsibility linking reward with labor. As a result, the level of management and the work quality of the medical and public health

organizations of rural collectives are especially improved. There have been improvements in the attitude of service and in the business income which have resulted in the general improvement of conditions for a large group of units depending upon the State for day to day support. According to statistics, the number of commune public health centers in need of State subsidies has been reduced from 15 percent in 1981 to the current 30 percent or thereabouts. The reform has brought new vitality to public health work.

There are needs for reform in all aspects of public health work. The key point at present is to reform the medical treatment and public health units under ownership by the whole people which have a larger staff and a heavier work load. The situation of "eating out of a big pot" must be broken down but some cadres are still afraid of reform. Some believe the condition of the public health department is special; it is very difficult to reform. They lack confidence. Some are afraid that the reform will mess up the original work procedure; there is no way to proceed easily. Some believe that if the budget is not raised, reform cannot be done very well, and so forth. These problems of understanding should be quickly resolved to enable a new situation to be created in public health work. There, of course, are difficulties in reform, but they can be overcome if the masses are relied upon to start steadfastly from reality and to proceed in guided and orderly steps, through experimental points, extending reform gradually. All the State operated medical and public health units in the province should; therefore, proceed with reform positively and cautiously. In the reform process, the responsibility system of the Staff Hospital of Shoudu Capital Steel and Iron Company, in the form of combining responsibility, authority, and benefit, should be positively extended, on the one hand, to fix quantitative and qualitative quotas of all items of work, to clarify job responsibility, to enforce strict inspection, and to reward diligence and to penalize laziness. On the other hand, the reform method and experience of those medical treatment and public health units in the province that have already reached a high level should be positively extended to raise the economic benefits and improve the work efficiency so that the condition of the work of managing the medical treatment and public health units owned by the whole people being inferior to that of the collective units may be gradually changed. There are differences between the reform of public health work and reform of other departments; therefore, efforts should be given to survey and research, to model demonstration, and to different guidance for different types to proceed in a guided and orderly manner. This is the only way to reform public health work really and substantially to search and produce a new way for the province's public health work and to create for it a new situation.

6248

CSO: 4008/97

MANAGEMENT OF SHOCK AT THE FRONT

Beijing CHINESE MEDICAL JOURNAL in English No 1, 1983 pp 27-28

[Article by Jin Bing]

**[Text]** The basic therapeutic principles in traumatic shock include removing the life-threatening cause and maintaining a patent airway; rapid restoration of adequate circulating blood volume, correction of acidosis; proper use of vasopressors or vasodilators; preservation of renal function; cardiotonics and/or corticosteroids and supplementary oxygen and intensive care.

The military surgeon's chief responsibility at the front is to save the lives of the severely wounded. Shock is common and requires tissue perfusion restoration. According to the estimated amount of blood loss, symptoms and signs, shock is differentiated into 3 grades: light, moderate and severe. A sphygmomanometric zero may not be very low but indicates vital organ perfusion is inadequate to sustain life. Our method of shock management stresses satisfactory pulse pressure and urinary output as more essential than vasoconstrictors as shock can be remarkably improved even though the BP remains fairly low. Reviewing the case reports of several battle wounded with reference to the literature,<sup>1-3</sup> the following management has been proved to be quite effective in severe shock.

During war of self-defense against Vietnamese wounded patients in shock due to hemorrhage accounted for more than 95% of

combat zone field hospital injuries and 80-85% of those in evacuation hospitals. Burns, toxemia and fracture malfixations were only 10%. 33.3% of shock cases belong to light shock, with blood loss accounting for about 25%, systolic BP was around 80 mm Hg. The other 2/3 was classified as moderate and severe shock with greater than 30% circulation volume blood loss, the systolic BP as a rule was below 70 mm Hg.

ILLUSTRATIVE CASES

**Case 1.** A gun shot wounded soldier with open fractures of both lower extremities, bleeding actively, was admitted with 40/0 BP. During surgery, 1,500 ml dextran solution, 1,000 ml Ringer's solution, 1,500 ml balanced salt solution, 250 ml 5% sodium bicarbonate, 400 ml plasma and 200 ml blood were infused within 3 hours. With debridement and control of bleeding, BP rose to 70/40. Dopamine 60 mg and hydrocortisone 200 mg were given by iv drip with BP fluctuating between 60-90/30 mm Hg, pulse 130/min. Additional cedilanid 0.2 mg given twice maintained the BP above 100/60. The BP remained steady during transport to the rear.

**Case 2.** A soldier with retained bullet in the abdomen was admitted in severe shock. BP was unobtainable despite rapid iv infusion. He was, however, mentally clear. First aid including pressure-dressing was of no use and the abdomen kept on distending. After 2,500 ml salt solution infusion, BP rose to 60/40 mm Hg.

Emergency exploratory laparotomy showed 4 ileac perforations and mesenteric artery injuries. During intestinal resection and vessel repair, the BP became unobtainable twice, but gradually returned to 90/70 mm Hg with 5,700 ml fluid iv infusion within 20 hrs. His state remained steady during transport to the rear.

**Case 3.** Comatous soldier with open fracture of the femur and extensive injuries of the adjacent blood vessels arrived in shock. BP was obtainable, the heart sound was feeble and respiration was Cheyne-Stokes in nature. Four venous lines were set up immediately and rapid infusion with 1,500 ml balanced salt solution, 800 ml blood. 500 ml plasma expander, 200 ml 5% sodium bicarbonate solution and 20 mg dexamethasone were given within 1 hr. Within 5 hrs 8,500 ml fluid were administered and the critical condition controlled.

**Case 4.** Soldier with lumbar region penetrating wound was admitted in severe shock. The intraabdominal injuries involved liver lacerations, transected injuries of the transverse colon and jejunum and generalized peritonitis. Urgent surgery and antishock therapy were instituted simultaneously. Control of bleeders, repair of hepatic lacerations and intestinal anastomoses were performed, the BP returning to 60/40 mm Hg. Infusion with aramine and noradrenaline postoperatively was not effective, but Chinese herb medicine with scopolamine kept the BP steady at 90/60 mm Hg. The 40.5 C fever in the next day was checked by cold sponges and hibernation including phenothiazine administration. The condition was further improved by iv infusion of sodium bicarbonate, cedilanid and dopamine. When the BP was maintained at around 100/70 mm Hg, uneventful evacuation accomplished.

Despite simultaneous operation and restoration of blood volume, postoperative vasoconstrictor administration did not benefit patients in severe shock. On the contrary, vasodilation therapy often improved microcirculation with return of body warmth and BP.

**Case 5.** Shell wounded over the lumbar region, with transverse colon perforation and right pneumothorax. Accidental cardiac standstill developed 5 min after the beginning of surgery. Measures to avoid irreversible cerebral and pulmonary edema and heart failure were successfully taken including hibernation, diuretics, scopolamine, cardiotonics and corticosteroids. The condition was greatly improved and 5 days later he was safely evacuated.

**Case 6.** Cadre with active bleeding following trauma of the right lower limb was admitted with 50/0 mm Hg BP. Dextran solution 1,500 ml and balanced salt solution 3,500 ml were given during debridement. Soon after surgery, the patient's pupils suddenly became dilated with concomitant cardio-respiratory arrest. Cardiac massage and artificial respiration restored spontaneous breathing and heart beat but the pupils remained dilated. BP was also very unstable. 650 ml whole blood, vasopressors, cardiotonics, mannitol, hypertonic glucose and respiratory stimulants were all administered without effect. The patient remained in irreversible shock and died.

The sudden cardio-respiratory collapse may have been due to anemic hypoxia following massive blood loss and too much hemodilution. If blood loss is too massive with grossly depleted RBC supply, the patient can hardly recover unless he receives enough blood transfusion. A hematocrit above 25-20% is desirable in most patients during emergency replacement of volume deficit.

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## LIFE SCIENCES

### MINISTRY OF PUBLIC HEALTH ELIMINATES 106 TYPES OF MEDICINE

Lanzhou GANSU RIBAO in Chinese 2 Oct 82 p 2

[Text] On 4 September, the Ministry of Public Health issued a notice announcing its decision to eliminate 127 types of chemical drugs. Twenty-one types, aside from the stock on hand, will be used until 1 January 1983, the remaining 106 types are not to be used as of now.

The 106 types, the application of which has been stopped include Injectio sodium salicylate, Tabella Phenacetin, Inj. Aminopyrium [Pyramidon], Tab. Aminopyrium, Tab. Antipyrinum [Pehnazone], Inj. Cinchophenum [Atophan], Tab. Cinchophenum, Inj. Aminopyrinum Composita (containing Wulatan [?]), Tab. Aminopyrinum Composita (containing Veramonum [Pyrabitalum]), Tab. Analgini Composita, Inj. Socium salicylate cinchophenum, Infant Fever-relieving Tablets, Tab. Isapheninum, Capsula Orotic acid, Tab. Santoninum, Tab. Santonini et Phenolphthaleini [Ascaridin Tab.], Tab. Santonini et Hydrargyri Monochloridi [Tab. Santonin Co.], Tab. Bepheninum [Phenethium], Tab. Imdazolyl, Tab. Hexaneresorcin (Cap.), Pilula Tetrachloroethylene, Tab. Atebrin [Metoquinine], Tab. Cyclochloroguanidine, Tab. Penicillin, Tab. Tab. Long-lasting Penicillinum G (Penicillinum G Benzathinicum [Benzylpenicillinum]), Unguentum Penicillinum, Oculentum Penicillinum, all types of Tetra Tetracycline (Hcl) for children, all types of Tetracycline (alkali) for children, Inj. intramuscular Tetracycline, Tab. Terramycinum [Oxytetracycline] for children, Sweetened Pulvis Terramycinum, Long-lasting Terramycinum granules, Inj. Terramycinum Hcl., Tab. Aureomycinum Hcl. [Chlorotetracycline], Sweetened Pulvis Aureomycinum, Aureomycinum Hcl. granules, Inj. Aureomycinum Hcl., Tab. Synthomycinum, Cap. Synthomycinum, Suppositorium Synthomycinum, Inj. Synthomycinum, Pulvis Synthomycinum, Tasteless Tab. Synthomycinum, Tasteless Syrupus Synthomycinum, In. Dihydrostreptomycinum sulfate, Injectio Dihydrostreptomycinum and its raw material, Unguentum Griseofulvinum, Inj. Prontosil, Tab. ST, Inj. ST, Inj. SM<sub>1</sub>, Tab. SM<sub>1</sub>, Tab. SMP, Tab. Trisulfone, Emulsio Trisulfone, Sulfonamide for children (Tab.), Kexielining [Sulfguanidine Tab.], Unguentum ST, Antiflamisonum [Pregnenolon-acetylsalicylate], Unguentum Trisulfone, Aqua Auristillae, Infant Amide (Tab.), Inj. Berberinum (all specifications), Collyria Berberinum, Syrupus Shuga, Syrupus Scilla (Squill), Syrupus Asthmatis, Tab. Glycyrrhizae Compositae (not containing opium but containing ammonium chloride, preparations containing isoephedrinum, Cap. Tussis, Tab. Tussis, Inj. Xindening [Practolol], Tab. Xindening, Tab.

Ismelin, Tab. Digoxin, Tab. Propranolol, Inj. Agrimoninae [extract Agrimonia eupatoria L. var. pilosa Makino], Tab. Agrimoninae, Pilula Ferrosi Sulfas Composita, Vitacibaomin Inj. (for man), Inj. Vitacibaomin (for woman), Tab. Vitacibaomin (for man), Tab Vitacibaomin (for woman), Tab. Orange peel glucoside Composita, Andu Tonic, Inj. Buliduo, Tab. Amytal, Inj. Sodium bromide, Inj. Camphor Oil, Inj. Wild Indigo alkaloid, Inj. Hepatic acid, Tab. Vitalitang, Inj. Bile, Inj. Antiflamison, Inj. Asthmatis, Antibacterial Dysentery Tablet, Antibacterial Dysentery Capsule, Antibacterial Dysentery Injection Solution, Tab. Spleen, Tab. Bixuelong [spleen blood improvement], Inj. Spleen, Cap. Bixuelong, Tab. Fetus Ovine, Tab. Rabbit Fetus, Tab. Xinjinin [paramyosin?], Inj. Xinjinin.

Beginning on 1 January 1983, the following 21 types will be stopped from being used: Eleo Pinicillinum, Aqua Griseofulvinum for skin disease, Tab. Choline Composita, Cap. Choline Composita, Inj. Choline Composita, Tab. Ganjianling [liver invigorating tablet], Tab. Vitamin B<sub>1</sub>C, Tab. Vitamin U, Inj. Vitamin U, Inj. Glucose Vitamine C, Tab. Three Vitamins, Liver Injection Solution, Inj. Liver B<sub>12</sub>, Tab. Liver B<sub>12</sub>, Liver Tablet Composita, Liver Phosphatide Tablet, Ganweilong Tablet [liver invigorating tablet] (capsule), Ganweilong Preparation Composita, Ganjing Tablet [essence of liver tablet], Ganping Tablet [liver calming tablet], Ganping Tablet Composita.

Note: (1) With this group of drugs which are to be eliminated, only the specified form and type are involved; other forms and specifications are not involved.

(2) These types to be eliminated include drugs for human use only; drugs for other uses are not involved.

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CSO: 4008/16

LIFE SCIENCES

MANAGEMENT OF A CASE OF ACUTE URANIUM POISONING AND RENAL FAILURE AFTER  
EXTENSIVE BURNS BY URANYL NITRATE

Beijing CHINESE MEDICAL JOURNAL in English No 1, 1983 p 78

[Abstract of article by Wu Jia-mei and Fang Ji-Xiong]

[Text]

A case of acute uranium poisoning and renal failure after extensive skull burns by uranyl nitrate was successfully managed. The load of uranium in the patient's body was estimated at 93-186 mg.

The successful management of this case indicated that completely washing off contaminations is important for the alleviation or prevention of uranium poisoning. Covering the wound with heterogenic skin (skin of pigling) as bio-dressing is helpful to promote recovery. The fundamental principles in managing acute renal failure are: strict water intake restriction, maintenance of electrolyte and acid-base balance, elimination of infection and adequate supply of nutrients.

CSO: 4010/65



## SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

### LIU JIAXI RECEIVES RETURNED PRC RESEARCHER

OW102230 Beijing XINHUA in English 1653 GMT 10 May 83

[Text] Beijing, May 10 (XINHUA)--Professor Lu Jiaxi, president of the Chinese Academy of Sciences, met here today with Hong Guofan, a returned scholar from Britain specializing in genetic research.

Hong Guofan, an assistant researcher at the Shanghai Institute of biochemistry, developed new techniques for the analysis of DNA--the basic building blocks of life--while working as a visiting scholar at the Laboratory of Molecular Biology of the Medical Research Council of Britain.

He returned here from London yesterday.

In his research, Hong Guofan developed methods of cutting fragments from the ends of long chains of nucleotides within DNA molecules. This made recovery of the particles easier and their analysis less time consuming.

The study of the sequences of nucleotides is of great importance in exposing the genetic information of organisms, and aids research in genetic engineering.

Hong Guofan told XINHUA that a "shotgun" method was formerly used for this purpose. He said scientists employed biochemical or chemical methods to cut long chains composed of thousands, or even tens of thousands, of nucleotides. They then analysed the fragments one by one and joined them according to their original sequences. "This method is accidental and the final joining is very complicated and difficult," he said.

Hong Guofan's research has been described as "very innovative," "outstanding" and "a contribution to DNA research" by the international scientific community.

In an interview with XINHUA, he said he planned to apply the results of his research to the study of the mechanisms of nitrogen fixation in China. "This work is very difficult and yet of great theoretical significance. Research in this field is developing very rapidly in the world," he added.

The Chinese Academy of Sciences has proposed granting Hong Guofan research-fellowship. The academic committee of the Shanghai Institute of Biochemistry will take decision on this later this month.

Hong Guofan graduated from the department of biology at Fudan University in Shanghai in 1964. He went to Britain in 1979 and worked under the guidance of Dr. Frederick Sanger, co-winner of the 1980 Nobel Prize for Chemistry.

CSO: 4010/63

## SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

### PRC SCIENTISTS DELEGATION ENDS CANADA VISIT

OW120400 Beijing XINHUA in English 0218 GMT 12 May 83

[Text] Ottawa, May 11 (XINHUA)--There are spacious prospects for scientific exchange and cooperation between China and Canada, according to Chinese scientists who have just concluded their two-week visit in Canada.

The nine-member delegation of the Chinese Academy of Sciences (CAS) led by Professor Gu Yijian, secretary general of the CAS and an organic chemist, arrived in Canada on April 27 at the invitation of the National Research Council of Canada (NRCC). It left Halifax for home today via the United States.

During their stay, the Chinese scientists visited universities, research institutes and laboratories in various cities as well as China's great friend Dr. Norman Bethune's birthplace.

They also discussed matters concerning scientific exchange and cooperation between CAS and NRCC with their Canadian counterparts.

According to reliable sources, a NRCC delegation is scheduled to visit China this fall and an agreement on scientific exchange and cooperation between CAS and NRCC is expected to be signed during its visit.

CSO: 4010/63

AUTHOR: CHEN Zaocheng [7115 5679 2052]

ORG: None

TITLE: "MYD-1 Microprocessor Teleprocessing Equipmant Undergone Certification"

SOURCE: Nanjing DIANLI XITONG ZIDONGHUA [AUTOMATION OF ELECTRIC POWER SYSTEMS]  
in Chinese No 1, Jan 83 inside backcover

ABSTRACT: In 2311 hours of operation from 25 Aug to 29 Nov 82, the system utilization rate of the MYD-1 microprocessor teleprocessing equipment operated in the Zhengzhou Power Supply Network reached 99.6 percent; the mean trouble free time (MTBF) was 460.4 hours; the maximum continuous operation time was 1278 hours; and more than 4,000 times of remote control operation, remote communication, and selective measurement were all correct and without error. A M68000 single chip microprocessor forms its nuclear component. The equipment may be used for remote control, remote communication, and remote measurement between the dispatch center and the transformer station. The information capacity is 64 targets (expandable to 128) for remote measurement, 86 for remote communication (expandable to 256), and 61 (expandable to more than 256) for remote control. Its certification conference was held in Zhengzhou on 5-7 Dec 82. The conference judged the equipment, jointly produced by Nanjing Research Institute of Automation and Zhengzhou Bureau of Power Supply, to be a new teleprocessing equipment that may be easily extended and have a promising future.

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CSO: 4009/162

AUTHOR: LIU Wenye [0491 2429 0673]

ORG: None

TITLE: "Third National Conference on Relays and Protection Systems Held in Nanning"

SOURCE: Nanjing DIANLI XITONG ZIDONGHUA [AUTOMATION OF ELECTRIC POWER SYSTEMS] in Chinese No 1, Jan 83 inside frontcover

ABSTRACT: The Third National Conference on Relays and Protection Systems, sponsored by China Society of Electrical Engineering, was held on 15-20 Dec 82 in Nanning of Guangxi Province and attended by 122 delegates representing units of research, designing, manufacturing, operation, and colleges of the field. Of the 126 papers received, 74 papers were selected for delivery before the 3 groups of line protection, components protection, and safety automation devices. Extensive discussions were arranged for 15 special topics, including protection of ultrahigh voltage grid, effects of harmonics and uneven load on relay protection, problems related to protection of generators, main lines, and transformers, guarantees for safe and stable operation of electric power systems, etc. This conference affirmed the achievements and progress made since the Second National Conference and pointed out outstanding problems. Future scientific activities and research subjects in the field of relays and protection systems were arranged. Detailed conditions of this conference will be reported in the next issue of this journal.

AUTHOR: LIU Wenxing [0491 2429 2502]

ORG: Central South Design Academy of Electric Power

TITLE: "BTDY Telecommunications Power Source Equipment for Electric Power System Communication Stations Undergone Certification"

SOURCE: Nanjing DIANLI XITONG ZIDONGHUA [AUTOMATION OF ELECTRIC POWER SYSTEMS] in Chinese No 1, Jan 83 inside frontcover

ABSTRACT: In response to a suggestion of International Electrical Engineering Committee (IEC) and in order to meet the needs for current retrofit of power source technology for communication of the power system and its long range development scheme to improve its reliability, Wuhan Electric Power Instrument Plant of Ministry of Hydroelectricity researched and produced the BTDY continuous telecommunication power source equipment. A certification conference under the auspices of Bureau of Machine Manufacture and Bureau of Communication Dispatch was held in Wuhan on 13-16 Dec 82. The conference concluded that strict experimentation and prolonged trial operation had proved the design to be advanced and the work process reliable. The property indices were judged to be the same as or close to the level of similar products made in foreign countries.

## Engineering

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LI Shabai [2621 3097 4101]  
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ORG: All of the Institute of Engineering Mechanics, Chinese Academy of Sciences

TITLE: "Some Features of Current Procedure for Strong-motion Data Processing and Analysis in China"

SOURCE: Harbin DIZHEN GONGCHENG YU GONGCHENG ZHENDONG [EARTHQUAKE ENGINEERING AND ENGINEERING VIBRATION] in Chinese No 1, 1983 pp 1-14

TEXT OF ENGLISH ABSTRACT: The main features of the strong-motion data processing procedure used in China are as follows: A different method is suggested for digitizing and connecting the successive sections of those long duration records requiring repositioning on the digitizer table. The method for instrument correction at both high and low frequency bands is prepared for accelerograms recorded by the accelerographs consisting of a pendulum-galvanometer system. In comparison with the bandpass filter parameters suggested by Professor Trifunac et al., quite different cut-off frequencies for low-pass and high-pass filters are used and restrictions on the  $f_{HC}$ , the cut-off frequencies for high-pass filter, from digitizing noise, the record length and undertainties of base-line are considered. In addition, the effects of the interpolation method on analytical results are also examined.

AUTHOR: XU Zhiying [1776 1807 5391]  
SHEN Zhujiang [3088 3796 3068]

ORG: XU of the East China Technical University of Water Resources; SHEN of the Nanjing Hydraulic Engineering Research Institute

TITLE: "Effective Stress Dynamic Analysis of Earth Dam at Yuecheng Reservoir with Emphasis on Aseismic Measure"

SOURCE: Harbin DIZHEN GONGCHENG YU GONGCHENG ZHENDONG [EARTHQUAKE ENGINEERING AND ENGINEERING VIBRATION] in Chinese No 1, 1983 pp 89-109

TEXT OF ENGLISH ABSTRACT: The earth dam at Yuecheng Reservoir has been stabilized by a counter weight fill on the upstream slope to prevent its slide failure as a result of static and seismic loading. In this paper, the performance of the dam sections with and without the counter weight fill has been compared by two-dimensional non-linear static and dynamic analysis. A static stress-strain analysis coupled with the seepage flow is used and the influence of the sudden drop of reservoir elevation is considered. An effective stress method for dynamic analysis is suggested. All of the computation is made by FEM with quadrilateral isoparametric elements. The effectiveness of the counter weight fill is evaluated through comparison of computed results in the following items: static stress, flow net, factor of slope

[Continuation of DIZHEN GONGCHENG YU GONGCHENG ZHENDONG No 1, 1983 pp 89-109]

stability, time history of response acceleration, time history of response shear stress, maximum dynamic shear stress and strain, distribution of earthquake-induced pore pressure in the dam, earthquake-induced residual deformation, earthquake-induced displacement, dynamic stability coefficient, etc.

This analysis shows that the counter weight fill on the upstream slope is effective.

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CSO: 4009/160

AUTHOR: E Xuequan [6759 1331 0356]

ORG: Institute of Mechanics, Chinese Academy of Sciences

TITLE: "Hypersonic Flow Behavior in Magnetohydrodynamic Channel"

SOURCE: Beijing LIXUE XUEBAO [ACTA MECHANICA SINICA] in Chinese No 2, 1983  
pp 134-143

TEXT OF ENGLISH ABSTRACT: For small magnetic Reynolds number  $R_m$  and small magnetic interaction parameter  $N$ , the effects of a continuous magnetic field on the hypersonic flow of an inviscid, compressible electrical conducting fluid are considered at the entrance region of the channel. The analytical expressions of electric current density and Lorentz force on the flow are obtained by solving the Laplace equation with the help of the complex variable function theory. The conditions causing circular electric current are found by the calculation. The perturbation equations and the integral formulas of the perturbation parameters are derived. The digital solutions of the perturbation equations show that the hypersonic flow has flow behavior analogous to an incompressible fluid. The characteristics of the flow near the specific points are discussed.

AUTHOR: WANG Zheng [3769 2973]

ORG: Chinese Aeronautical Establishment

TITLE: "Conditional Displacement Method in Structural Analysis"

SOURCE: Beijing LIXUE XUEBAO [ACTA MECHANICA SINICA] in Chinese No 2, 1983  
pp 206-208

TEXT OF ENGLISH ABSTRACT: This paper analyzes the mechanical features of the thin-walled joint structure which is widely applied in flight vehicles. A "fictitious space-pin element" representative of these features and a corresponding idealized method of the joint structure are suggested. The inter-constraint conditions among some nodal points of such an idealized structure are presented. Two solutions of the displacement method under the conditions, the features of the corresponding assembling matrix equations and their applied range are briefly described.

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CSO: 4009/156

END